Genomics Division

Integrated Safety Management Plan

Walnut Creek, CA

June 29, 2005

As defined by

Environment, Health and Safety Division

Lawrence Berkeley National Laboratory

University of California

Berkeley, CA 94720

APPROVALS

Prepared by Regulatory Compliance Specialist	Date
Reviewed by Genomics Division Deputy Director	Date
Approved by Genomics Division Director	Date

TABLE OF CONTENTS

1.0 Introduction

The Genomics Division encompasses the Joint Genome Institute (JGI) Production Genomics Facility (PGF) in Walnut Creek, and the Building 84 Genome Center on the campus of the Lawrence Berkeley National Laboratory (LBNL) in Berkeley. In 1996, the Department of Energy (DOE) established the JGI, the unification of human genome and related genomics research efforts at LBNL, Lawrence Livermore National Laboratory (LLNL), and the Los Alamos National Laboratory (LANL). In 1999, the University of California leased 56,000 square feet of office and laboratory space in Walnut Creek, California creating the Production Genomics Facility (PGF) to house the physical operations of the JGI and to accommodate over 150 employees.

2.0 Preamble

A Memorandum of Understanding (Attachment 1) signed by the Division Director and the Directors of the three participating National Laboratories specifies that support of environmental, health and safety (EH&S) programs at the PGF be provided to the JGI by the LBNL EH&S Division. Consequently, the Genomics Division Director has agreed to abide by all of the requirements imposed by the LBNL Director. LBNL's EH&S policies and requirements are documented in the following publications:

- Regulations and Procedures Manual (RPM)
  http://www.lbl.gov/Workplace/RPM

- Health and Safety Manual (PUB 3000)
  http://www.lbl.gov/ehs/pub3000/

- Integrated Environment, Health & Safety Management Plan (PUB 3140)
  http://www.lbl.gov/ehs/ism/Index.html

- Work Smart Standards (WSS)
  http://labs.ucop.edu/internet/comix/contract/LBNL/wss_lbnl.pdf

- Office of Assessment and Assurance (OAA)
  http://www.lbl.gov/ehs/oaa/

The Genomics Division Integrated Safety Management (ISM) Plan guides the Division's work activities. ISM, taken from DOE Order 450.4, Safety Management Systems Policy, sets forth the seven guiding principles and the five core functions that enable work to be conducted safely within the Division, as follows:

2.1 Seven Guiding Principles of ISM

2.1.1 ***Line management responsibility for safety (EH&S)*** – Line management is responsible for the protection of the public, the workers, and the environment. Division line managers are responsible for integrating EH&S into work and for ensuring active communication up and down the management line and with the workforce.

2.1.2 ***Clear roles and responsibilities*** – Clear and unambiguous lines of authority and responsibility for ensuring ES&H are established and maintained at all organizational levels within the Division, and for work performed by its contractors.

2.1.3 ***Competence commensurate with responsibilities*** – Personnel must possess the experience, knowledge, skills, and abilities to discharge their responsibilities. Division management to ensure that the appropriate depth and breadth of technical talent is available to periodically evaluate competencies. Competence includes training, experience, and fitness for duty.

2.1.4 ***Balanced priorities*** – Resources are effectively allocated to address ES&H, programmatic, and operational considerations. Protecting the public, workers, and the environment is a priority whenever activities are planned and performed.

2.1.5 ***Identification of safety standards and requirements*** – Before work is performed, the associated hazards are evaluated and an agreed-upon set of standards and requirements are established. These standards, if properly implemented, provide adequate assurance that the public, workers, and environment are protected from adverse consequences.

2.1.6 ***Hazard controls tailored to work being performed*** – Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

2.1.7 ***Operations authorization*** – The conditions and requirements that must be satisfied for operations to be initiated and conducted are clearly agreed upon.

2.2 Five Core Functions of ISM

2.2.1 ***Plan for the work –*** Clear definition of the tasks to be accomplished as part of any given activity.

2.2.2 ***Analyze the hazards*** – Analysis and determination of the hazards and risks associated with any activity; in particular, risk to employees, the public, and the environment.

2.2.3 ***Develop and implement hazards controls*** – Controls sufficient to reduce the risks associated with any activity to acceptable levels.

2.2.4 ***Perform work within controls –*** Conduct of the tasks to accomplish the activity in accordance with the established controls.

2.2.5 ***Provide feedback and continuous improvement*** – Implementation of a continuous-improvement cycle for the activity, including incorporation of employee suggestions, lessons learned, and employee and community outreach, as appropriate.

The Genomics Division conducts operations in a manner that protects the health and safety of its employees, guests, visitors, contractors and the general public that does not endanger the environment, and is consistent with applicable LBNL, University of California and government agency policies and regulations. This ISM Plan ensures that the objectives of the LBNL EH&S Division are met. In addition, the JGI has developed a Safety Plan for the PGF, which assures that safety, health and environmental performance is addressed uniformly for all employees, regardless of home laboratory affiliation.

3.0 Responsibility and Accountability

3.1 ***Director***. The Genomics Division Director is ultimately responsible and accountable for assuring that all operations are conducted in a manner that protects the health and safety of employees, guests, visitors and the environment, and is in compliance with all LBNL EH&S policies and requirements. The Director may request assistance from Deputy Director, PGF Operations Manager, and others as needed to execute the ISM, but retains overall responsibility and authority for EH&S management and performance within the Division. The Director and other key staff receive immediate notification regarding any significant issues. They also receive quarterly status reports on occupational injuries and accidents, and minutes from committee meetings (see section 7.0).

3.2 ***Line Management***. In keeping with the first principle of ISM, Division Managers, Group Leaders and Team Leaders serve as line management with the primary responsibility for maintaining a safe work place. This includes identifying and evaluating hazards in their work areas, instituting corrective actions and appropriate controls, assuring that employees possess the proper qualifications and training for their job function, communicating ES&H information to staff, and increasing and maintaining employee awareness of ES&H issues. In general, line managers must ensure that the five core functions of ISM are implemented at all stages of research and production. Line managers are also responsible for the safety of contracted work by assuring that qualified contract workers, contractors and service vendors are selected, hazards are identified and communicated, and work is performed safely within all Division facilities.

3.3 ***Employees***. All Division employees and contractors are required to conduct work safely at all times, and adhere to applicable policies and procedures. If employees or contractors have questions or concerns about the safety or environmental impact of an activity, they have the obligation to exercise LBNL's "Right To Stop Unsafe Work" policy, and to resolve the concern before proceeding with the associated work. These procedures are found in PUB 3000, Chapter 1 – Section 1.5 (Stopping Unsafe Work): http://www.lbl.gov/ehs/pub3000/CH01.html#_Toc407015329.

3.4 ***Division EH&S Coordinators.*** EH&S Coordinators are responsible for administering the ES&H program, as outlined in LBNL PUB 3000. The JGI EH&S Coordinator is responsible for administering the program at the PGF, and the Life Sciences Division Coordinator is responsible for administration at Building 84 Genomics. Coordinators, under the supervision of and reporting to the Division Director, develop site-specific policies and procedures for hazard analysis and control. Coordinators also provide technical support and guidance to line management and employees, and coordinate resources to address issues and implement the program. In addition, Coordinators direct the efforts of the EH&S committees; manage the Self-Assessment program; and advise the Director, Deputy Director and other staff on all ES&H-related issues.

4.0 Description of Division Operations and Organizational Structure

The Genomics Division Director maintains offices at the PGF in Walnut Creek and at Building 84 in Berkeley. The PGF staff is composed of approximately 150 employees, about one half from each LLNL and LBNL. The PGF is comprised of the following departments: Operations, Sequencing, Informatics, Evolutionary Genomics, Genomic Technologies, Vertebrate, Computational Genomics, Genome Biology, Microbial Ecology and Community Sequence. Approximately 30 employees work at Building 84. All departments, including the Building 84 Genome Center, report to the Deputy Director, who reports to the Division Director. (See Attachment 2.)

Since its inception, the JGI's mission has expanded beyond the sequencing of the human genome to characterizing those of other important organisms of the biosphere. Additional programs entail the development of new genomics technologies, bioinformatics and computational genomics as well as evolutionary genomics.

In February 2004, the JGI launched the Community Sequencing Program (CSP) with the primary goal of providing world-class sequencing resources for the expanding the diversity of disciplines geology, oceanography, and ecology, among others that can benefit from the application of genomics. The JGI considers CSP applications from researchers geared toward generating informative DNA sequence from whole organisms or communities of organisms.

5.0 Scope of Work Authorized

The operations conducted within the Genomics Division are an extension of the research at the Genome Centers of the participating national laboratories. The hazards associated with the genomic research conducted at the three labs have already been identified and documented; similar hazards have been identified within the Division. Additional operations specific to the production sequencing environment at the PGF have also been identified and authorized by LBNL management and EH&S personnel. Management and supervisors have ensured that the proper controls are in place to minimize the risk to human health and the environment from these operations.

Any changes in current operations that may introduce a hazard not previously identified must be reviewed with the Division's EH&S Coordinators. Supervisors are required to involve the appropriate Operations Manager, Facilities Manager, EH&S Coordinator, EH&S Committee and/or other pertinent supervisors and staff, as necessary, prior to initiating a new process or operating a new piece of equipment. Supervisors are required to prepare EH&S documentation and obtain required approvals for potentially hazardous or regulated work as specified in Chapter 6 of LBNL's PUB 3000 prior to commencement of work. Such documents may include Biological Material Registrations, Human, Animal and/or Biological Use Authorizations, and Activity Hazard Documents.

The Genomics Division has adopted the LBNL Activity Hazard Document (AHD) method of identifying hazards associated with specific operations, and ensuring that proper controls are in place to conduct the operation safely. The PGF Production Department has an active AHD for its Class IIIb laser in the ABI 3730 and Megabace 4500 sequencers. The LBNL Waste Management Group has approved work authorizations for the WAA and SAAs. At Building 84, an RWA is in place for radiation work.

6.0 Qualification and Training

The Genomics Division uses the Job Hazard Questionnaire (JHQ) to identify hazards and required training at the employee level. The JHQ allows supervisors to identify appropriate training requirements based on job hazards. All employees and guests who work within the Genomics Division for more than 30 days in a calendar year are required to complete and review JHQs with their supervisors. In addition, supervisors are required to meet at least annually with each of their employees to discuss qualifications and training of the employee, and to assure that the employee's skill and knowledge is commensurate with the hazards in his or her work environment.

Supervisors must document that required employee training has been received and is appropriate to the hazards of the work being done, or as required by law or laboratory policies. Supervisors are responsible for ensuring that all students, contractors, and other guests complete required training. Required training includes official EH&S courses, initial training on new instrumentation or equipment provided by vendors, and training provided by supervisors or other qualified personnel on an ongoing, on-the job basis. Each of these types of training is documented using a class roster and input into a training database. Supervisors may consult employee or guest training profiles via the intranet at http://training.lbl.gov/EHSStart.asp to determine the level of training.

Qualifications include documented experience, knowledge, training and certifications required by law, or by Division and LBNL policy. An employee's qualifications may be documented in any manner chosen by his or her supervisor, provided that a photocopy of this documentation is placed in the employee's personnel file. For contract labor employees, the LBNL EH&S Division will furnish such documentation to Division management.

7.0 Committees

The PGF Safety Committee is comprised of both supervisors and staff from different areas of the facility, representing different functional areas of the production sequencing and research process. The Director appoints members to the committee based on the JGI make-up. Active safety committee members serve as primary points of contact during the annual self-assessment inspections.

Headed by the PGF EH&S Coordinator, this committee meets 3-4 times annually to identify and discuss ES&H-related concerns arising from the different functional groups and to disseminate essential operations-level information to the staff. Topics of discussion may include hazardous chemical handling and disposal, exposure assessments, policy and procedure review, equipment use, training or any of a variety of ES&H challenges facing the group. The committee members provide feedback to their respective groups. Minutes are provided to the members and JGI staff.

A representative from the Building 84 Genome Center participates on the Life Sciences Division EH&S committee, which meets 5 times annually. Activities are essentially similar to those conducted by the PGF Safety Committee.

8.0 Accident Investigation

Whenever there is a recordable injury, the Genomics Division conducts an accident investigation. Together with the appropriate EH&S Coordinator, Division EH&S Liaison, the injured employee and the responsible supervisor discuss the event. The group considers the causes of the accident and future measures that will enable safe job performance and tracks implementation of corrective actions. When appropriate, Lessons Learned and other feedback mechanisms are communicated to Division committees and staff. The results are reported to the Genomics Division Director, who holds line management accountable for accident investigation and resolution.

9.0 Feedback and Improvement

ES&H issues arising from laboratory walkthroughs, occurrence and injury reports, JHQs and Lessons Learned are addressed in committee meetings, providing an effective mechanism of feedback. Applicable information from LBNL's Lessons Learned Program and Division incidents are disseminated to all staff for accident prevention and hazard awareness.

ES&H coordinators and Division line managers conduct annual safety walkthroughs to assess compliance status and promote safety awareness. The results are recorded and tracked via the LBNL-wide Laboratory Corrective Action Tracking System (LCATS) database of deficiencies and corrective actions.

The Division implements a Self-Assessment Program in accordance with LBNL PUB 3105, the LBNL Self-Assessment Manual. Operations are evaluated and measured according to the Self-Assessment Performance Criteria (e.g. work authorizations, training documentation, line management involvement). Findings are documented in the Laboratory Self-Assessment Database and reported to the Office of Assessment and Assurance at the end of each fiscal year.

10.0 Funding and Resources

The Genomics Division Director, Deputy Director and Principal Investigators incorporate ES&H concerns in their resource allocations for all projects and proposals. This includes, but is not limited to, funding for safety equipment, permits, training, maintenance, waste disposal and facilities modifications unless covered by institutional funding sources. The LBNL EH&S Division provides additional support services.

The following distribution of resources is allocated to EH&S efforts to ensure proper implementation of the Genomics Division ISM Plan. These resources may be adjusted as needed with concurrence of LBNL EH&S.

PGF Support

0.2 FTE – PGF Head Operations Manager

1.0 FTE – PGF Division Safety Coordinator

0.1 FTE – PGF Facilities Manager

0.05 FTE – PGF Safety Committee Members

LBNL Support

0.1 FTE – PGP EH&S Division Liaison

0.2 FTE – EH&S Industrial Hygiene

0.2 FTE – EH&S Waste Management

Building 84 Support

0.13 Life Sciences EH&S Coordinator

Attachment 1 – Memorandum of Understanding for the DOE Joint Genome Institute

Attachment 2 – Genomics Division Organizational Chart